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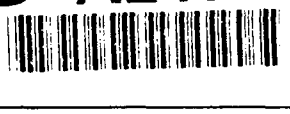

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13. ABSTRACT (Maximum 200 words)

Qualification tests were performed to determine whether the in-service Mk 461 Mod 1 Shipping and Storage Container could be utilized to contain properly dunnaged solid type hazardous materials weighing up to a gross weight of 67 kg (148 pounds). The tests were conducted in accordance with Performance Oriented Packaging (POP) requirements specified by the United Nations Recommendations on the Transportation of Dangerous Goods, ST/SG/AC.10/1 and the Code of Federal Regulations, Title 49 CFR, Parts 107 through 178. The container has conformed to the POP performance requirements; i.e., the container successfully retained its contents throughout the specified tests.

14. SUBJECT TERMS

POP Test of Mk 461 Mod 1 Shipping and Storage Container

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PERFORMANCE ORIENTED PACKAGING TESTING OF CONTAINER, SHIPPING AND STORAGE, MK 461 MOD 1 FOR PACKING GROUP II SOLID HAZARDOUS MATERIALS

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April 1992

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INTRODUCTION

This Performance Oriented Packaging (POP) test was performed to ascertain whether the Mk 461 Mod 1 Shipping and Storage Container (Packing Group II) meets the requirements specified by the United Nations Recommendation on the Transportation of Dangerous Goods Document, ST/SG/AC.10/1, Revision 6, Chapters 4 and 9 and the Code of Federal Regulations, Title 49 CFR, Parts 107 through 178, dated 1 October 1991. The container contents consisted of one inert SM2 Block IIIB Guidance Section weighing 52 kg (115 pounds). Gross weight of the loaded container was 67 kg (148 pounds).

Due to unavailability only two containers were used for testing. This is less than the number required by the regulations. Approval for this deviation has been granted by the Under Secretary of Defense, Memorandum for the Joint Logistics Commanders dated 22 February 1990. The containers were identified as #1 and #2.

TESTS PERFORMED

1. Base Level Vibration Test

This test was performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.608. The container #1 was placed on a repetitive shock platform which has a vertical linear motion of 1-inch double amplitude. Movement of the container was restricted during vibration in all but the vertical direction. The frequency of the platform was increased until the container leaves the platform 1/16 of an inch at some instant during each cycle. Test time was 1 hour.

2. Stacking Test

This test was performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.606. The container #1 was subjected to a force applied to its top surface equivalent to the total weight of identical packages stacked to a height of 3 meters (including the test container). A weight of 268 kg (592 pounds) was stacked on the test container. The test was performed for 24 hours. The weight was then be removed and the container examined.

3. Drop Test

This test was performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.603. Five drops were performed from a height of 1.2 meters (4 feet), impacting the following surfaces:

a. Flat bottom using container #1.

b. Flat top using container #1.

c. Flat on long side using container #1.

d. Flat on short side using container #1.

e. One corner using container #2.

PASS/FAIL

1. Base Level Vibration Test

The criteria for passing the base level vibration test is outlined in Title 49 CFR, Sec. 178.608(c): No test sample should show any deterioration which could adversely affect transportation safety or any distortion liable to reduce packaging strength.

2. Stacking Test

The criteria for passing the stacking test is outlined in Title 49 CFR, Sec. 178.606(d): No test sample may show any deterioration which could adversely affect transportation safety or any distortion likely to reduce its strength, cause instability in stacks of packages, or cause damage to inner packagings likely to reduce safety in transportation.

3. Drop Test

The criteria for passing the drop test is outlined in Title 49 CFR, Sec. 178.603(f): A package is considered to successfully pass the drop tests if for each sample tested, no rupture occurs which would permit spillage of loose explosive substances or articles from the outer packaging.

TEST RESULTS

1. Base Level Vibration Test

Satisfactory.

2. Stacking Test

Satisfactory.

3. Drop Test

Satisfactory.

DISCUSSION

1. Base Level Vibration Test

The input vibration frequency was 3.5 Hz. Immediately after the vibration test was completed, the container was removed from the platform, turned on its side and inspected. No unfavorable distortion or deterioration was observed.

2. Stacking Test

The container was visibly checked after the 24-hour period was over. No unfavorable distortion or deterioration was observed.

3. Drop Test

After each drop, the tested container was inspected. The guidance section was completely retained by the container.

REFERENCE MATERIAL

A. United Nation's "Recommendation on the Transportation of Dangerous Goods," ST/SG/AC.10/1, Revision 6.

B. Code of Federal Regulations, Title 49 CFR, Parts 107-178.

C. Bureau of Explosives Tariff No. BOE 6000K Hazardous Materials Regulations of the Department of Transportation by Air, Rail, Highway, Water including Specifications for Shipping Containers.

DISTRIBUTION LIST

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TEST DATA SHEET

DATA SHEET:	
Container: Mk 461 Mod 1 Shipping and Storage Container	
Type: 4H1	**Container P/N or NSN:** N/A
Specification Number: DL 6213011	**Material:** Polystyrene Bead Foam
Gross Weight: 67 kg (148 pounds)	**Dimensions:** 52.4" L x 24" W x 24" H
Closure (Method/Type): PPP-T-97 Tape	**Tare Weight:** 15 kg (33 pounds)
Additional Description:	
PRODUCT:	
Name: See table	**NSN(s):** See table
United Nations Number: See table	
United Nations Packing Group: II	
Physical State (Solid, Liquid, or Gas): Solid	
Vapor Pressure (Liquids Only): N/A	**At 50 °C:** N/A **At 55 °C:** N/A
Consistency/Viscosity: N/A	**Density/Specific Gravity:** N/A
Amount Per Container:	**Flash Point:** N/A
Net Weight: See table	
TEST PRODUCT:	
Name: SM2 Blk IIIB Guidance Section	**Physical State:** Solid
Consistency: N/A	
Density/Specific Gravity: N/A	
Test Pressure (Liquids Only): N/A	
Amount Per Container: N/A	**Net Weight:** 52 kg (115 pounds)

TABLE 1
Products Approved for Shipping in the
Mk 461 Mod 1 Shipping and Storage Container

NALC	NSN	Type	Packing Drawing	UN Code	UN Number	#/ Cntr	Weight (lb)
N/A	N/A	SM2 Blk IIIB Guidance Sect	6213011	N/A	N/A	1	115

N/A = Not Assigned

MK 461 MOD 1
SHIPPING AND STORAGE CONTAINER
POP MARKING

UN 4H1/Y88/S/**/USA/DOD/NAD

** YEAR LAST PACKED OR MANUFACTURED

Encl (2)